

# **Sawtimber management and natural reforestation - Robert McCormack**

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## **Overview**

Any discussion of sawtimber management must begin with clearly defining land owner objectives. It is important that the land owner have a vision and clear understanding of what they hope to achieve in managing their forest land. In any forest management activities, the land owner, logger and forester all have a significant role to play. Communication of land owner objectives is extremely important in this regard. This discussion will be an overview of various silvicultural systems in order to demonstrate different options. The discussion will include natural reforestation, intermediate treatments and harvest systems. The discussion will demonstrate how these different phases are related and the continuous nature of forest management. For the purposes of this discussion "sawtimber" will be defined as trees that will yield at least one sawlog with a minimum small end diameter of 10 inches and a minimum length of 8 feet. This sawlog will have at least 2 faces free from defects.

## **Landowner Objectives**

The success of sawtimber management is measured not only by how well the management produces sawlogs, but also how well the management achieves other land owner objectives. In order for this to occur, the land owner must develop a clear set of objectives for their forest management. Production of sawtimber may only be one of several objectives that could include, wildlife habitat, water quality, aesthetics, recreation and other forest products. Clear objectives along with information on timber stand characteristics will provide a foundation for a forest management plan. A management plan, formal or informal, is an effective way to communicate objectives and the steps that will be taken to accomplish the plan. It is very important that all parties involved, land owner, logger and forester share a common understanding of the objectives and how they will be achieved. Taking these steps to identify objectives and develop a plan will tremendously increase the potential for success.

## **The Continuous Cycle**

For discussion purposes we will review three distinct phases, regeneration, intermediate treatments and harvest systems. In reality, silviculture and forest growth are continuous cycles with all phases being very closely related. Intermediate treatments will have an impact on how quickly stands or individual trees reach

maturity. They can also impact species composition of stands which eventually determines which species will regenerate naturally. Harvest systems will determine how successfully natural reforestation will take place. A challenge in silviculture and forest management is to carefully understand these relationships so as to better achieve the land owner objectives.

## **Reforestation**

Many northeastern timber species have the ability to reforest or regenerate themselves naturally. This natural regeneration depends on the individual species ability to produce and disperse seed as well as the site conditions that may be created naturally or by forest management activities. Depending on the type of harvest system used, (even-aged or uneven-aged) different age class structure and species composition may be created. Harvest systems will be discussed in more detail later. Natural regeneration will usually come in the form of seedlings, which are produced directly from seed, stump sprouts which originate from stumps and existing root systems, and root suckers that sprout directly from root systems. Different species may offer different types of natural regeneration. Generally, seedlings offer more favorable characteristics of tree form and are less susceptible to disease than stump sprouts and root suckers. Advanced regeneration can be established under a closed canopy of a timber stand. Since this is regeneration that is established under the canopy, it consists of shade tolerant species such as maple and beech.

The success of natural regeneration can be effected by many factors. These include such things as seed supply and dispersal, moisture conditions, soil scarification, advanced regeneration, vegetative competition, deer browse, and many others. Since we are dealing with the management of a natural resource, we do not have control over all the factors that influence regeneration. The best approach is to manage the factors that we have control over, try to have a positive influence on the factors that we cannot control, and learn as much as we can about the factors that we cannot control or influence.

It is very important that natural reforestation objectives be communicated to those involved in carrying out the logging or other treatments. Every activity or disturbance that takes place in the timber stand has the potential of impacting the success of reforestation.

## **Intermediate Treatments**

Generally, the objective of sawtimber management is to favor trees or groups of trees that have the potential to become a sawlog. In evaluating this potential species, tree form and defect will be considered. This evaluation should be made within the context

of the land owner objectives and the sawlog markets that will eventually be served. Intermediate treatments take place early in the development of individual trees or groups of trees and prior to maturity. Treatments that do not result in merchantable products are referred to as pre-commercial. Treatments that yield merchantable products are referred to as commercial. Timber Stand Improvement (TSI) work is usually a pre-commercial treatment. TSI is usually an activity that somehow weeds out less desirable trees (as defined by the landowner objectives), and may also control spacing and stocking of the stand. Thinnings accomplish the same objectives and quite often are commercial treatments. There are several types of thinnings all of which consider crown class, crown closure, stand stocking and species. Individual tree form and vigor are important considerations in any intermediate treatment. By favoring trees with better form and vigor the objective of producing sawtimber will be achieved more successfully. In addition, these more desirable trees will also provide the seed source for the next generation of trees, passing along their desirable traits. Crop tree release is another type of intermediate treatment. In this method individual crop trees are identified and released so they are free to grow. In order to identify crop trees it is once again important to have a clear understanding of land owner objectives.

Since intermediate treatments are taking place during the growth and development of the stand, there are some risks associated with these activities. Epicormic sprouting can take place when dormant buds become active as a result of heavy thinnings. Some species such as yellow birch are susceptible. This type of sprouting would be considered a defect on sawlogs. Butt scarring can also result in defects on valuable sawlog trees. Wind throw and thinning shock are other risks that should be considered.

## **Harvest Systems**

For this discussion, harvest systems refers to the activities that harvest the mature trees and create favorable conditions for the desired natural reforestation. An important part of the land owner objectives defines maturity. Sawtimber being a primary objective, maturity will deal with the value of various sawtimber species and the length of time it takes to achieve this value. Maturity is usually defined in terms of d.b.h. (diameter breast height). The definition of maturity should also consider other land owner objectives.

Even-aged harvest systems create stands that have a relatively narrow range of age classes. Even-aged refers to age classes and not diameter classes. Stands that are considered even-aged will have a distribution of diameters. Even-aged methods include seed tree methods, shelterwood methods, and clearcut methods. Each of these methods may have some variations. Even-aged management will favor more shade

intolerant species such as aspen, cherry, red and white oak, and yellow birch. All of these methods can be designed to achieve the land owner's reforestation objectives.

Uneven-aged harvest systems create and maintain stands that usually have 3 or more distinct age classes. These stands will have a more complex age class and diameter class distribution. The understory is well established and made up of shade tolerant species such as beech and hard maple. Treatments and activities in uneven-aged stands usually require work in a number of age and size classes. This may be necessary to maintain the desired age distribution. Quite often activities in uneven-aged stands will include harvests of mature trees, intermediate treatments in the form of thinnings, and establishing reforestation or favoring advanced regeneration. Commonly used uneven-aged methods in the northeast include single tree selection and group selection. In these methods tree or group selections are based on such things as species, vigor, diameter, quality and spacing.

When comparing even-aged and uneven-aged systems the land owner must consider all of their objectives as well as the characteristics of the species that make up the stand.

### **Summary**

Successful sawtimber management and natural reforestation efforts requires a clear understanding of land owner objectives and a plan to achieve these objectives. Depending on these objectives, there are a variety of methods available. There are many dynamics that take place as timber stands grow and mature. Understanding these dynamics and interrelationships is the key to success. Since tree growth and forest management is a continuous process, every silvicultural and management decision will provide another set of decisions and opportunities.

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